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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/525,733	02/28/2005	Yoshitaka Nakajima	07241.0038	2552
22852	7590	04/30/2008		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 901 NEW YORK AVENUE, NW WASHINGTON, DC 20001-4413			EXAMINER LAO, LUN S	
			ART UNIT 2615	PAPER NUMBER
			MAIL DATE 04/30/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/525,733

**Applicant(s)**

NAKAJIMA ET AL.

**Examiner**

LUN LAO

**Art Unit**

2615

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 07 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 2-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Introduction***

1. This action is responses in the amendment filed on 02-07-2008. Claims 2-4, 11-13, and 15-16 have been amended and claims 17-20 have been added. Claims 2-20 are pending.

### ***Continued Examination Under 37 CFR 1.114***

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02-07-2008 has been entered.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 11-13, 15 and 17-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 17-19 recites "A communication device for sampling non-audible sounds generated by a person", which is unclear to examiner how does a person generate

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non-audible sounds such as sub-sonic and ultra-sonic. Applicant further mention that vibrations transmitted only through soft tissue are also "non-audible sounds" (see the remarks page 8 last paragraph). What is the frequency range for soft tissue "non-audible sounds" to define the "non- audible sounds".

Consider claims 11-13 and 15 they are essentially similar to claim 17-19 and are rejected for the reason stated above apropos to claims 17-19.

***Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 4, 16-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058).

Consider claim 17 Burnett teaches a communication device for sampling non-audible sounds generated by a person, comprising:

a microphone (see fig.2 (10)); and

a positioning structure coupled to the microphone, the positioning structure positioning the microphone on a surface of skin over a muscle below a mastoid of the person (reads on back of neck, and see col.5 line 15-25) so as to detect non-audible vibrations transmitted through flesh of the person and conducted through the skin (see fig.7 and col. 2 line 41-col. 4 line 13); but Burnett does not explicitly teach the positioning

structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person. Burnett teaches the positioning structure positioning the sensor on back of the neck where speech production can be detected.

Since, Burnett does not limited what the positioning structure positioning the microphone on a surface of skin have to be, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the invention of Burnett by implementing a particular arrangement ( such as, the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person) as claimed based on the designer's reference and needs for the purpose of acquiring the desired audio sound quality of the output signal to the listener in the acoustical environment.

Consider claim 16 Burnett teaches a signal processing apparatus (see figs. 1-7) that processes a signal sampled through the microphone according to claim 17(see above claim 17 rejection).

Consider claim 4 Burnett teaches a communication interface system comprising the microphone and a signal processing apparatus that processes a signal sampled through the microphone, wherein a result of processing by the signal processing apparatus is used for communications(see figs.1-7 and col. 2 line 41-col. 4 line 13).

Consider claim 19 Burnett teaches a method for detecting non-audible sounds generated by a person, comprising:

attaching a microphone on a surface of skin over a muscle below a mastoid of the person(reads on back of neck, and see col.5 line 15-25 and fig.7)); and generating an

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electrical signal from the microphone corresponding to vibrations generated by the person and conducted through the skin(see figs.2, 7 and col. 2 line41-col. 4 line 13); but Burnett does not explicitly teach the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person. Burnett teaches the positioning structure positioning the sensor on back of the neck where speech production can be detected.

Since, Burnett does not limited what the positioning structure positioning the microphone on a surface of skin have to be, therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modified the invention of Burnett by implementing a particular arrangement ( such as, the positioning structure positioning the microphone on a surface of skin over a sternocleidomastoid muscle below a mastoid of the person) as claimed based on the designer's reference and needs for the purpose of acquiring the desired audio sound quality of the output signal to the listener in the acoustical environment.

Consider claim 20 Burnett teaches the non-audible sounds include a murmur and a respiratory sound (see figs.2, 7 and col. 2 line41-col. 4 line 13 and col. 5 lines 15-25).

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Scanlon (US PAT. 5,853,005).

Consider claim 18 Scanlon teaches a communication device for sampling non-audible sounds generated by a person, comprising:

a diaphragm(see fig. 14 (12)) having a surface for attachment to skin of the person; a suction member (128) attached to the diaphragm so as to form a chamber (129) interior of the suction member and the diaphragm; and a microphone (14, reads on transducer) attached to the suction member and disposed so as to generate electrical signals corresponding to vibrations induced in the chamber by vibrations transmitted through the diaphragm from the skin (see fig. 14 and col. 10 line 14-58); but Scanlon does not explicitly teach a diaphragm having an adhesive surface and being removable.

However, the examiner takes official notice that a diaphragm having an adhesive surface and being removable is well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art that acoustic monitoring system as taught by Scanlon could have a diaphragm having an adhesive surface and removably as claimed in order to provide engage the surface to reduce the noise.

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) in view of Iwata (US PAT. 4,654,883).

Consider claims 2-3 Burnett does not explicitly teach the microphone comprising a diaphragm installed on the surface of the skin and a sucker that sticks to the diaphragm; and the microphone which is integrated with a head-installed object such as glasses, a headphone, a supra-aural earphone, a cap, or a helmet which is installed on the human head.

However, Iwata teaches that the microphone comprises a diaphragm (see fig.3, (22)) installed on the surface of the skin and a sucker that sticks to the diaphragm (see col. 3 line 30-56) and the microphone (see fig.1, (17)) is integrated with a head-installed object such as glasses, a headphone, a supra-aural earphone, a cap, or a helmet which is installed on the human head (see fig.2 and see col. 3 line 30-56).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Iwata into Burnett to provide more accurate speech recognition.

9. Claims 5-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burnett (US PAT. 7,246,058) in view of Holzrichter (US PAT. 5,729,694).

Consider claim 5 Burnett does not explicitly teach the communication interface system, wherein the signal processing apparatus includes an analog digital converting section that quantizes a signal sampled through the microphone, a processor section that processes a result of the quantization by the analog digital converting section, and a transmission section that transmits a result of the processing by the processor section to an external apparatus.

However, Holzrichter teaches the communication interface system wherein the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone (see fig. 20, (91-93, EM sensor)), a processor section (90) that processes a result of the quantization by the analog digital converting section(see fig.5, 49 and col. 14 line



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46-col. 15 line 67), and a transmission section that transmits a result of the processing by the processor section to an external apparatus (96 and see col. 56 line 35-55).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Holzrichter into Burnett to provide different configurations and control systems for the quality of the data collection, and sound unit parsing.

Consider claims 6-8, Holzrichter teaches the communication interface system wherein the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone and a transmission section that transmits a result of the quantization by the analog digital converting section to an external apparatus (see fig. 20, (96) and see col. 56 line 35-55) and in that the external apparatus processes (such as cellular) the result of the quantization (see col. 16 lines 51-67); and the signal processing apparatus includes an analog digital converting section (see fig.5, 49 and col. 14 line 46-col. 15 line 67) that quantizes a signal sampled through the microphone (EM sensor), a processor section that processes a result of the quantization by the analog digital converting section, and a speech recognition section that executes a speech recognition process on a result of the processing by the processor section (see fig.8 and see col. 16 line 51-col. 17 line 18); and a transmission section that transmits a result of the speech recognition by the speech recognition section to an external apparatus(see fig.8 and see col. 16 line 51-col. 17 line 18).

Consider claims 9-12, Holzrichter teaches the communication interface system wherein an apparatus (see figs. 8 and 20) in a mobile telephone network executes a speech recognition process on the result of the processing by the processor section, the result being transmitted by the transmitting section(see col. 16 line 51-col. 17 line 18 and see col. 56 line 35-55); and the signal processing executed by the signal processing apparatus is a modulating process in which the process section modulates the signal into an audible sound (see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process applies a fundamental frequency of the vocal cords to the non-audible murmur to convert the non-audible sound into an audible sound involving the regular vibration of the vocal cords(see figs 4-7 and see col. 15 line 29-col. 16 line 50); and the modulating process converts a spectrum of the non-audible sound not involving the regular vibration of the vocal cords into a spectrum of an audible sound uttered using the regular vibration of the vocal cords(see figs 4-7 and see col. 15 line 29-col. 16 line 50).

Consider claims 13-15, Holzrichter teaches that the communication interface system wherein the modulating process uses the spectrum of the non-audible sound (see figs 14A-15B) speech recognition apparatus to recognize phonetic units such as syllables, semi- syllables, phonemes, two-juncture phonemes, and three-juncture phonemes and uses a speech synthesis technique to convert the phonetic units recognized into an audible sound uttered using the regular vibration of the vocal cords (see figs. 4-7 and see col. 20 line 16-67); and input gain (see fig.5, (47)) is controlled (45) in accordance with a magnitude of a dynamic range of a sound sampled through the microphone (EM

sensor and see col. 15 line 29-67); and the speech recognition section appropriately executes speech recognition utilizing an acoustic model of at least one of the non-audible sound, a whisper which is audible but is uttered without regularly vibrating the vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur (see figs 9a-10b), and various sounds such as a teeth gnashing sound and a tongue clucking sound (see col. 6 line 45-col. 7 line 64 and col. 9 line 16-col. 10 line 68) .

Consider claims 11-15 Burnett teaches that the communication interface system wherein the modulating process applies a fundamental frequency of the vocal cords to the non-audible sounds to convert the non-audible sounds into an audible sound involving the regular vibration of the vocal cords(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the modulating process converts a spectrum of the non-audible sounds not involving the regular vibration of the vocal cords into a spectrum of an audible sound uttered using the regular vibration of the vocal cords(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the modulating process uses the spectrum of the non-audible sounds and a speech recognition apparatus to recognize phonetic units such as syllables, semi-syllables, phonemes, two-juncture phonemes, and three-juncture phonemes and uses a speech synthesis technique to convert the phonetic units recognized into an audible sound uttered using the regular vibration of the vocal cords (see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system wherein an input gain is controlled in accordance with a magnitude of a dynamic range

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of a sound sampled through the microphone(see figs. 1-10 and col. 2 line 41-col. 4 line 13); and the communication interface system, wherein the speech recognition section appropriately executes speech recognition utilizing an acoustic model of at least one of the non-audible sounds, a whisper which is audible but is uttered without regularly vibrating vocal cords, a sound uttered by regularly vibrating the vocal cords and including a low voice or a murmur, and various sounds such as a teeth gnashing sound and a tongue clucking sound(see figs. 1-10 and col. 2 line 41-col. 4 line 13).

### ***Response to Arguments***

10. Applicant's arguments with respect to claim2-20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yang (US PAT. 6,519,345) is cited to show other related microphone and communication interface system.

12. Any response to this action should be mailed to:

Mail Stop \_\_\_\_ (explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Facsimile responses should be faxed to:  
**(571) 273-8300**

Hand-delivered responses should be brought to:  
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Randolph Building  
401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (571) 272-7501. The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao, Lun-See  
/Lun-See Lao/  
Examiner, Art Unit 2615  
Patent Examiner  
US Patent and Trademark Office  
Knox  
571-272-7501  
Date 04-25-2008

/Vivian Chin/  
Supervisory Patent Examiner, Art Unit 2615